

Decision Making Styles Associated with Adolescent Risk Taking Behavior

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by

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Abstract

Adolescent risk taking behavior research rarely takes a decision making perspective. Seventy-one adolescents (ages 17-20) completed a two-part study using the Risk Involvement and Perception Scale and the Decision Making Styles Inventory. Pearson's correlation coefficients reveal intuitive decision making styles have a positive correlation with risk involvement, while analytical decision making styles negatively correlate with risk involvement. In the study's second part, three risk taking scenarios were presented, each having both a "risky" and "nonrisky" intended behavior option. ANOVAs show participants induced to be analytical decision makers do not rate the "risky" behavior option as more risky than participants who received no decision making induction. Future research should examine the stability of decision making styles and determine whether or not one style is more adaptive for adolescents.

Decision Making Styles Associated with Adolescent Risk Taking Behavior

Adolescence is known as a time of change in one's life. It is a transitional period between childhood and adulthood, and a time when young people develop the skills necessary to prepare them for adult roles and responsibilities (Harris, Duncan, & Boisjoly, 2002). During a developmental time when adolescents are given more freedom in making decisions about their behavior, many researchers are interested in the degree to which adolescents engage in risk taking behavior (Furby & Beyth-Marom, 1992; Rolison & Scherman, 2002). Certain adolescent risk taking behaviors, such as cigarette smoking and unprotected sexual intercourse, are of higher interest for researchers than other behaviors (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993; Siegel, Cousins, Rubovits, Parsons, Lavery, & Crowley, 1994).

Researchers have studied adolescent risk taking behavior from several different perspectives, including dispositional traits (Crisp & Barber, 1995; McCord, 1990) and biological models (Irwin & Millstein, 1986; Udry, 1988, 1990). Research has also examined separately the influences of developmental stages (Millstein & Igra, 1995; Petersen, 1988) and decision making (Beyth-Marom et al., 1993; Furby & Beyth-Marom, 1992). Although much research exists on this topic, it appears that results from different perspectives do not offer conclusive insight into adolescent risk taking behavior (Rolison & Scherman, 2002).

Because there is a lack of conclusive results on some aspects of adolescent risk taking behavior, research associated with these perspectives should continue. In order to design effective, successful programs for preventing certain adolescent health-risk behaviors such as smoking and risky sexual behavior, we need to understand the

underlying causes of risk taking behavior. Accordingly, the present research examines adolescent risk taking behavior from a decision making perspective with the aim of identifying a relationship between decision making styles and risk taking behaviors.

Cognitive Styles

One of the earliest attempts to classify individuals into various cognitive styles was Kopfstein's (1973) study on risk taking in children. Sixty fourth-grade children (ages 9-10 years) completed Kagan's (1966) Matching Familiar Figures task and were dichotomously classified as having either reflective or impulsive cognitive styles. Participants were then administered Slovic's (1966) "toggle-switch" risk taking task. The toggle-switch game allowed participants the opportunity to switch the positions of 0 to 9 toggle-switches, given the information that nine out of the ten were "safe" switches and resulted in a gain of two cents for each of these correctly identified, while the remaining one was a "danger" switch, thus resulting in a loss of all previous gains. Participants were measured on how many switches they moved, thus being categorized into level of risk taking.

The purpose of this task was to determine if a participant was more likely to stop moving switches voluntarily, thus a low risk taker, or continue to move switches until he/she moved the danger switch and was forced to stop, thus engaging in a higher risk taking behavior. The average number of switches moved was used as a measure to assess risk taking behavior on the game. Kopfstein predicted that impulsive children would take more risks than those classified as reflective. However, results showed there was no significant difference between cognitive style and this type of risk taking behavior.

Kopfstein suggested future research should investigate multiple variables together, such as the influences of personality and cognitive variables.

In another study from the decision making perspective, Rolison & Scherman (2002) assessed participants' perceived benefits and costs of certain risk taking behaviors. In their study, 171 older adolescent participants (ages 18-21) completed three questionnaires, one of which was the Risk Involvement and Perception Scale (RIPS), designed by Siegel et al. (1994). The RIPS presents participants with 19 behaviors ranging from low to high risk, such as playing contact sports and taking crack/cocaine. Participants rated their frequency of participation, perceived risk, and perceived benefit of each of the risk taking behaviors (RTBs).

Results showed there was a significant negative correlation between risk frequency and perceived risks, while there was a positive correlation between risk frequency and perceived benefits. These findings suggest that the more risky one perceives a behavior, the less likely he/she will be to participate in it. Conversely, the more beneficial one perceives a behavior, the more likely he/she is to engage in it.

Past research has examined various components of the decision making perspective, and several decision making style assessments have been developed. Johnson (1978) created the Decision Making Inventory, which uses two aspects (spontaneous versus systematic, internal versus external) to assess individuals on two bipolar dimensions: information gathering and analyzing styles. Thus, Johnson's Decision Making Inventory classifies individuals as having spontaneous-internal, spontaneous-external, systematic-internal, or systematic-external decision making styles.

Additionally, Scott & Bruce (1995) developed a decision making scale. The General Decision-Making Style measure (GDMS) classifies individuals as having one of five independent decision making styles: rational, avoidant, intuitive, dependent, and spontaneous decision making styles.

Although various decision making style assessments have been developed, the current study will use a scale designed by Nygren (2000). He developed a measure that differentiates between people's propensities to think more analytically or more intuitively. The Decision Making Style Inventory (DMI) contains three scales that measure separate decision making styles: analytical (ANA), intuitive (INT), and regret-based emotional (REG) decision making styles. A series of maximum likelihood factor analyses conducted over a three-year period (each with samples $n = 400$ to 800 undergraduate participants ages 18-21) show the three scales are orthogonal, or statistically independent. This implies that an individual may score high (or low) on *both* ANA and INT scales, and not necessarily high on only the ANA or INT scale.

Furthermore, Nygren (2000) reported that the construct validity of the ANA scale is supported in that high analytical individuals are less likely to be risk seeking or impulsive (partial correlation with impulsivity, $r = -.394$, $p < .01$). Conversely, the construct validity of the INT scale is supported by the partial positive correlation with risk taking ($r = .232$, $p < .01$) and impulsivity ($r = .320$, $p < .01$). Although only moderate partial correlations where gender was partialled out, these results suggest high intuitive decision makers are likely to be more risk seeking and impulsive.

In the same study, Nygren (2000) performed an experiment using the computer-based Multi-Attribute Task Battery (MAT) by Comstock & Arnegard (1992) in

correlation with the DMI. The MAT simulated tasks faced by pilots in flight, and participants (undergraduate students) were asked to respond to various tasks simultaneously. Results indicated that participants who scored high on only the ANA scale tended to perform more poorly than those participants whose scores indicated a greater propensity to think more intuitively. This suggests there may be individuals whose decision making styles allow them to be more adaptive than others to certain situations, and this is in congruence with findings by Payne, Bettman, & Johnson (1993).

If adolescents who have a flexible decision making style are better adaptive in complex task performance, then might there be a particular decision making style which is more adaptive to risk taking behaviors? If such a relationship exists, researchers could gain a more comprehensive understanding of adolescent risk taking behaviors and be able to better apply risk taking prevention programs toward those adolescents who are more likely to engage in risk taking behaviors.

In a related area, if certain decision making styles are more adaptive than others, there might be a way to teach adolescents how to adopt various styles. Past research on decision making styles lacks a method for manipulating decision making style. However, the current study proposes an induction method designed to make adolescents use a more analytical decision making style. If successful, researchers could use this induction technique to further develop a method for teaching adolescents how to adopt various decision making styles.

Risk Involvement and Risk Perception in Adolescents

Ajzen & Fishbein's (1980) Theory of Reasoned Action states that one's attitude toward a behavior will directly affect and determine one's behavior. We can examine

this theory by assessing its applicability to adolescents' risk and benefit perceptions of a behavior. In a study designed to measure adolescents' risk and benefit perceptions and risk involvement, Siegel et al. (1994) created the Risk Involvement and Perception Scale (RIPS). The RIPS is a questionnaire composed of three subscales: frequency of self-reported involvement in a set of behaviors (Involvement), perceived benefits of engaging in those behaviors (Perceived Benefits), and perceived risks of engaging in those behaviors (Perceived Risks).

As expected by Theory of Reasoned Action, researchers in Siegel et al.'s study on adolescent participants (ages 18-21) found a positive correlation between benefit perception and risk involvement, and a negative correlation between risk perception and risk involvement. Thus, the greater an adolescent perceives the risk of a behavior to be, the less likely he/she is to engage in that behavior. In contrast, the more beneficial an adolescent perceives a behavior, the more likely that individual is to engage in it. These correlations between risk and benefit perceptions and risk involvement have been supported by results of several subsequent studies on adolescent participants, age range 11-21 years (Lavery, Siegel, Cousins, & Rubovits, 1993; Parsons, Siegel, & Cousins, 1997; Rolison & Scherman, 2002).

Several researchers (Deldin & Levin, 1986; Lavery et al., 1993; Rolison & Scherman, 2002, 2003) have suggested future research involving adolescents should aim to devise procedures that obtain data that is more reflective of actual decision making in risk taking behavior, such as risky behavior scenarios. Although originally used to study developmental differences between adults and adolescents in generating possible consequences of a behavior, three risky behavior scenarios adapted from Beyth-Marom et

al.'s (1993) study will be used in the current study to compare risk perceptions between experimental conditions.

Furthermore, several past studies have only compared adolescents to adults in risk perception and behavior involvement (Beyth-Marom et al., 1993; Cohn, Macfarlane, Yanez, & Imai, 1995; Halpern-Felsher, Millstein, Ellen, Adler, Tschann, & Biehl, 2001). However, the current study will examine adolescents in comparison to other adolescents. By examining adolescents' various decision making styles and comparing their risk involvement, I hope to determine if adolescents with a certain decision making style are more likely to engage in risk taking behaviors than adolescents with a different decision making style.

In the current study, I will be interested in the relationship between decision making styles and various aspects of adolescent risk taking behavior, such as risk perception and risk involvement. The first part of my study is a correlational design between two variables: risk involvement and decision making style. I will examine the relationship between decision making styles and risk involvement, as determined by participants' (ages 17-20) ratings on the DMI questionnaire and Involvement subscale ratings of the RIPS inventory.

The second part of the study is a randomized two-group (between-subjects independent variable induction condition: analytical decision making induction, no induction) by three-group (within-subjects independent variable scenario: drive, smoke, sex) experimental design. I will be using three risk taking scenarios, each having two intended behavior options. Participants in the no induction condition will have no decision making style induction, while those in the induction condition will be induced to

have a high analytical decision making style by listing possible risks and benefits of each behavior option. Both conditions will choose an intended behavior option and rate their risk perception of both options. The risk perception ratings will be used to examine the relationship between induction versus no induction conditions to determine if the induction method was successful.

Hypotheses

I predict there will be a positive correlation between risk involvement and the intuitive decision making style. Because the intuitive scale has a strong, positive correlation with risk taking and impulsivity, I propose that “intuitive” decision making adolescents will be more likely to engage in risky behaviors.

In contrast, I predict there will be a negative correlation between risk taking involvement and the analytical decision making style. Thus, those adolescents employing a highly analytical decision making style will be less likely to engage in risk taking behaviors. This hypothesis is based on the finding that highly “analytical” decision making adolescents have a negative correlation with impulsivity.

Furthermore, I predict those adolescents induced to use an analytical decision making style will perceive the “risky” behavior scenario option to be more risky than those who receive no decision making style induction. The basis for this final hypothesis comes from Millstein & Halpern-Felsher’s (2002) review suggesting risk takers view their behavior risks as less significant than non-risk takers. Therefore, if adolescents induced to be analytical decision makers are also low risk takers, as predicted, then they should perceive the “risky” scenario behavior option as having a higher risk than those

adolescents who receive no induction. There should be no significant difference between scenario conditions' perceived risk ratings of the "nonrisky" behavior.

Method

Participants

Seventy-one late adolescent (ages 17-20), undergraduate introductory psychology students at The Ohio State University were recruited to participate in this study. Participants confirmed a verbal informed consent prior to beginning the study and received REP credit toward their course grade. To control for outlying factors that may be associated with risks of behaviors engaged in by participants over age 21, only the data from participants ages 17-20 years were analyzed. All students completed the study.

Materials

The Decision Making Styles Inventory (Nygren, 2000) is a computer-based questionnaire. The DMI contains 45 scale items, with 15 items on each of three scales: "Analytical," "Intuitive," and "Regret-based Emotional" decision making styles. This set of items was produced from a series of maximum likelihood factor analyses conducted over a three-year period, each based on samples of 400-800 students. Scale items involved different situations about making decisions, and participants indicated the degree to which they agreed or disagreed with the statement, using a 1-6 Likert scale (ranging from 1 = Strongly Disagree, 6 = Strongly Agree). The three scales on the DMI were internally reliable (coefficient α 's equal to .883, .862, and .861 for ANA, INT, and REG, respectively). A sample of $n = 90$ students took the inventory twice, four to eight weeks apart, producing test-retest reliabilities of .816, .814, and .872 for ANA, INT, and

REG, respectively. The current study will only be concerned with the analytical and intuitive decision making scales.

The Risk Involvement and Perception Scale-Revised (Parsons et al., 1997) is a questionnaire that was modified from an original version designed by Siegel et al. (1994). The original RIPS is a questionnaire composed of three subscales: frequency of self-reported involvement in a set of behaviors (Involvement), perceived benefits of engaging in those behaviors (Perceived Benefits), and perceived risks of engaging in those behaviors (Perceived Risks). The list of 19 behaviors varies in degrees of risk, from low (e.g. taking prescription drugs) to high (e.g. driving while drunk). The researchers assessed the reliability of the RIPS by computing Pearson product-moment correlations among subjects' ratings on the three subscales at Time 1 and Time 2. The mean correlations between total scores at T1 and T2 for the Involvement, Perceived Risks, and Perceived Benefits subscales were .86, .62, and .63, respectively (all $ps < .001$).

Furthermore, correlations between subjects' involvement and perceived benefits were positive for all behaviors (Mean $r = +.55$), and highly significant (all $ps < .001$). Conversely, correlations between involvement and perceived risks were generally negative for all behaviors (Mean $r = -.22$) but considerably weaker, although still largely significant (all $ps < .01$). Although Parsons et al. (1997) found the variance accounted for by perceived risks was significant and above and beyond the variance accounted for by perceived risks, partial correlations showed a stronger correlation between perceived benefits and behavior intentions than between perceived risks and intentions for three factors: alcohol RTBs, illegal drug RTBs, and imprudent RTBs. Consistent with previous studies using the RIPS (Lavery et al., 1993; Siegel et al., 1994), Parsons et al.'s

(1997) findings support the idea that perceived benefits are more predictive of risk taking behavior involvement than are perceived risks, among late adolescent college students.

The RIPS-Revised (Parsons et al., 1997) was modified to eliminate items with very low involvement, add additional items, and clarify wording. It contains 17 individual behaviors ranging from low to high riskiness. In addition to the three subscales previously identified, the RIPS-R includes a fourth subscale for behavioral intentions. The inventory assesses (1) involvement during the last 3 months (involvement subscale), (2) predicted involvement during the next 3 months (behavioral intentions subscale), (3) how risky it would be to engage in the behavior (perceived risks subscale), and (4) how beneficial it would be to engage in the behavior (perceived benefits subscale). A 0-8 Likert scale is used, ranging from never to daily (involvement and behavioral intentions), not at all risky to extremely risky (perceived risks), and not at all beneficial to extremely beneficial (perceived benefits). The current study uses only fifteen of the RIPS-R's seventeen updated behaviors and will not be concerned with the behavioral intentions subscale.

Three risk taking scenarios were adapted from Beyth-Marom et al. (1993). Each scenario was described as a one-time choice in a specific situation that college adolescents might encounter; two intended behavior options were presented for each scenario. One option was intended to be "risky" while the other was intended to be "nonrisky." These scenarios dealt specifically with the risk taking behaviors of driving while drunk, smoking marijuana, and having unprotected sex. The scenarios were worded as follows, with "nonrisky" behavior options presented in brackets:

Drink and drive: Your friends ask you to come along with them for a drive after a party where everyone has been drinking. You decide to [not] join them.

Smoking marijuana: You are at a party where marijuana is passed around. You decide to [not] smoke marijuana.

Having sex: You discuss with your girl/boy friend whether or not to have sex together, but neither of you has protection. Both of you decide to [not] have sex.

Risk taking scenarios are being used to help control for the issue of self-report on the risk taking behavior Involvement subscale, and may depict a participant's true intended behavior more accurately without the problem of demand effects. Furthermore, results from the components of the scenario task (e.g. perceived risk, intended behavior) may provide us with a deeper understanding of the decision making process used in adolescent risk taking behavior.

Design and Procedure

The first part of the current study is a correlational design between two variables: risk involvement and decision making style. The second part of my study is a randomized two-group (between-subjects independent variable induction condition: analytical decision making induction, no induction) by three-group (within-subjects independent variable scenario: drive, smoke, sex) experimental design. Experiment sessions were randomly assigned to scenario condition by a randomized computer output. Participants completed basic demographic information, the DMI and RIPS-R before being presented three risk taking scenarios with two possible behavior options each.

Independent variables

The between-subjects independent variable of induction condition had two levels: analytical decision making induction and no induction. The primary difference between induction and no induction condition is analytical decision making induction condition participants were asked to list two possible risks and two possible benefits of each behavior option, therefore helping them adopt a more analytical decision making style. Then, they chose how they would most likely behave in that situation and rated the overall risk of both options. Those in the no induction condition were not required to list the risks and benefits but were asked to simply choose their intended behavior then rate the overall risk of both options.

The within-subjects independent variable of scenario had three levels: scenarios one (drive), two (smoke), and three (sex). Each participant was presented with all three scenarios in the aforementioned order, and the use of multiple scenarios was to ensure varying levels of risk perception among the behaviors.

Dependent variables

Involvement subscale and decision making style.

Participants rated their involvement of the 15 RIPS-R behaviors on a 1-9 Likert scale (ranging from never to daily). All participants' scores were averaged for a total involvement score for each behavior. Participants rated their agreement or disagreement with the 15 statements on each of three subscales for the analytical, intuitive, and regret-based emotional decision making styles. Only the analytical and intuitive styles were of concern, and participants' ratings (on the 1-6 Likert scale) were averaged for an analytical score as well as an intuitive score.

Scenarios.

Participants rated the perceived overall risk of both possible scenario options on a 1-9 Likert scale (ranging from “not at all risky” to “extremely risky”). The dependent variable here is the numerical rating of the “risky” behavior option. A comparison of the “risky” behavior ratings helps determine if the adolescents in one scenario condition perceived the “risky” behavior as significantly riskier than adolescents in the other condition perceived it to be.

Results

All participants completed the study, but two participants’ data were excluded for being older than age 21. An alpha level of .05 was used for all statistical tests. The 15 behaviors on the RIPS-R were ordered according to participants’ average risk perception, with “drive while drunk” being the riskiest behavior ($M = 8.42$, $SD = 1.26$) and “take/use prescription drugs” as the least risky behavior ($M = 3.63$, $SD = 2.47$). See Table 1 for complete rank ordering.

Pearson’s correlation coefficients were computed for the DMI scales (analytical and intuitive) and the RIPS-R subscales (involvement, perceived risk, perceived benefit) by behavior (see Table 2). The behaviors have been ordered according to the six factor loadings identified in Parsons, Siegel, & Cousins (1997): alcohol, illegal drug, sexual, stereotypic male, socially acceptable, and imprudent behaviors. There is a significant negative correlation between the analytical decision making style and involvement for five of the fifteen risk taking behaviors, with the two strongest correlations for “ride with a drunk driver” and “walk alone at night” (r ’s = $-.317$ for both, $p < .05$) (see Table 2 for complete list of correlations). There is also a significant positive correlation between the

intuitive decision making style and involvement for six of the behaviors, the strongest correlation for “get drunk” ($r = .392, p < .05$).

These correlations suggest the higher a person scores on the analytical decision making scale the *less* likely he/she is to engage in risk taking behaviors, and the higher a person scores on the intuitive decision making scale the *more* likely he/she is to be involved in risk taking behaviors. Although six of the seven significant correlations between the intuitive scale and involvement were positive, one significant correlation was negative. The intuitive scale and involvement correlation for the “take/use prescribed drugs” behavior was negative ($r = -.278, p < .05$), suggesting those participants scoring higher on the intuitive scale were less likely to take or use prescribed drugs.

Pearson’s correlation coefficients computed among the RIPS-R subscales are also presented in Table 2. Of particular importance is that all of the significant correlations between involvement and perceived risk are negative correlations, the strongest for “smoke marijuana” and “drink alcohol” (both r ’s = $-.461, p < .05$). This negative correlation suggests the more risky one perceives a behavior to be, the *less* likely he/she is to engage in it. Additionally, the eleven behaviors with significant correlations between involvement and perceived benefit are all positive correlations, with the strongest for “binge/purge” ($r = .648$), and “smoke marijuana” ($r = .643$), both p ’s $< .05$. This positive correlation indicates the more beneficial a person perceives a behavior to be, the *more* likely he/she is to engage in that behavior.

A one between-subjects, two within-subjects 2 X (3 X 2) ANOVA was conducted on condition by (scenario by option rating) and revealed a significant main effect of option rating, $F(1, 69) = 315.13, p < .01$ (see figure 1). The first scenario’s “risky”

behavior option ($M = 7.48, SD = 1.99$) was rated as more risky than the “nonrisky” behavior option ($M = 2.58, SD = 2.16$), as was the case for scenario two’s “risky” ($M = 6.16, SD = 2.47$) and “nonrisky” ($M = 1.79, SD = 1.51$) options and scenario three’s “risky” ($M = 7.06, SD = 1.89$) and “nonrisky” options ($M = 2.18, SD = 2.14$). This significant F -value indicates that our manipulation worked; across scenarios, participants rated the “risky” behavior option ($M = 6.90, SE = 0.19$) as more risky than the “nonrisky” option ($M = 2.18, SE = 0.16$), as predicted.

A one between-subjects, one within-subjects 2 X (3) ANOVA was conducted on condition by scenario for the “risky” behavior option rating, and there was no significant difference for condition affecting the perceived risk of the “risky” behavior option, $F(1, 69) = .043, p > .05$. However, there was a significant scenario by condition interaction for the perceived risk of the “risky” behavior option, $F(2, 138) = 2.70, p = .071$. Figure 2 suggests the interaction is condition by scenario between scenarios two and three. As predicted, for scenario two the average perceived risk rating of the “risky” behavior option was higher in the analytical induction condition ($M = 6.42, SD = 2.15$) than in the no induction condition ($M = 5.85, SD = 2.79$). However, for scenario three, just the opposite trend is present. Those participants in the analytical induction condition, on average, rated the “risky” behavior as *less* risky ($M = 6.71, SD = 2.14$) than those participants in the no induction condition rated it ($M = 7.46, SD = 1.48$).

Additionally, a one between-subjects, one within-subjects 2 X (3) ANOVA was also conducted on condition by scenario for the “nonrisky” behavior option rating. Similar to the “risky” options’ ratings, there was no significant difference for condition affecting the perceived risk of the “nonrisky” behavior option, $F(1, 69) = .23, p > .05$, as

predicted (see figure 3). Additionally, there was no significant interaction of scenario by condition for the “nonrisky” behavior options’ ratings, $F(2, 138) = 2.11, p > .05$.

Although not significant, it is worth noting that the average perceived risk of the “risky” behavior option was highest for scenario one ($M = 7.48, SD = 1.99$), followed by scenario three ($M = 7.06, SD = 1.89$) with scenario two’s “risky” behavior rated least risky ($M = 6.15, SD = 2.46$). The same general trend of scenario one having the highest average risk perception ($M = 2.58, SD = 2.16$) followed by scenarios three ($M = 2.18, SD = 2.14$) and two ($M = 1.79, SD = 1.51$) is also present for the “nonrisky” behavior option rating.

Discussion

RIPS-R and DMI

As predicted, there was a significant correlation between decision making styles and risk involvement for adolescents. There was a strong, positive correlation between risk involvement and the intuitive decision making style for six of the fifteen behaviors presented in this study. Additionally, there was a strong, negative correlation between risk taking involvement and the analytical decision making style for five of the aforementioned behaviors. Only one behavior (“ride with drunk driver”) had significant correlations with both analytical and intuitive decision making styles. These results suggest those adolescents who are highly intuitive decision makers are *more* likely to engage in risk taking behaviors, and adolescents who score higher in analytical decision making are *less* likely to be involved in certain risk taking behaviors.

Along with the aforementioned predicted correlations, there was a negative correlation between risk involvement for the “take/use prescribed drugs” behavior and the intuitive decision making style. This suggests that the more intuitive a person is in

making decisions the less likely he/she is to take or use prescribed drugs. When examining this unpredicted correlation, it is worthy to note that the “take/use prescribed drugs” behavior received the lowest perceived risk rating. Having been perceived as the least risky behavior of the 15 presented, do adolescents even consider this particular behavior to be a “risk taking” behavior? These results would suggest the answer is “no.”

Future research should aim to determine why particular RTBs correlate with one decision making style over the other. If this can be done, then perhaps researchers can use adolescents’ decision making styles to predict the likelihood of their involvement in a particular risk taking behavior or set of risk taking behaviors (e.g. sexual, alcohol, imprudent). Furthermore, future research using the DMI and a much larger sample size should try to classify participants according to decision making style (high in only ANA or INT, high in both, low in both) and determine if one overall decision making style is more adaptive to risk taking behavior involvement for adolescents.

Perceived risks of scenario options

My prediction that adolescents who are induced to think analytically will perceive the risky-behavior option as significantly more risky than those who receive no induction was not supported by significant results. There are many possible explanations for this, including too small of a sample size or not a strong enough decision making induction. There is also the possibility that inducing someone to think more analytically does not have any affect on one’s perceived risks of a behavior. Future studies should aim to use more scenarios and a more effective decision making induction to determine whether or not it would even be advisable to teach adolescents a particular decision making style in order to reduce their risk taking behavior. If future studies determine that decision

making inductions do not affect a person's perceived risk of a behavior, then something more must be done to change their perceived risks and benefits of certain behaviors if we are to ultimately change adolescents' risky behaviors.

Additionally, the lack of an induction main effect may be due to the idea that an individual differences variable such as decision making style is quite stable by this age and cannot be influenced enough to change perceived risks or intended behavior. If stability of decision making style during late adolescence is the explanation for the current study's results, an interesting question for developmental researchers might be to determine if decision making style is also stable for pre-adolescents (e.g. 10-12 year olds). Perhaps a decision making induction would have a greater affect on younger individuals if their decision making styles are less stable.

The significant interaction between scenarios two and three on perceived risk of the "risky" behavior options revealed a surprising reverse effect of condition for scenario three. That is, participants in the analytical induction condition perceived the risky behavior to be *less* risky than those participants in the no induction condition. As the only scenario directly involving two people making a decision (you and your girl/boy friend), the nature of this consensual agreement may have led participants to have a lower perceived risk of the risky behavior.

Additionally, participants in the induction condition were asked to list two possible benefits of the "risky" behavior option, and their perceived benefits may have outweighed their perceived risks. Future research should measure both perceived risk and benefit of the scenario options to determine if one predicts behavior better than the other or if there is a correlation between the two (e.g. perceived risk and perceived

benefit as compliments that can be “traded off” versus both of them being rated highly at the same time).

Importance

The current study’s findings are an important step in the decision making research on adolescent risk taking behavior, and can be used as a stepping stone in designing effective programs for preventing or decreasing adolescent risk taking behavior, such as risky sexual behavior and adolescent cigarette, drug, and alcohol use. Although only correlational, the relationship between decision making styles and involvement in various risk taking behaviors is one that should be further examined in order to gain a more comprehensive knowledge about adolescents’ risk taking decisions and the underlying causes of their risk taking behavior. Only after we determine the underlying causes of their behavior can we then design and implement programs that lessen adolescent risk taking behaviors and promote healthy behaviors.

References

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Beyth-Marom, R., Austin, L., Fischhoff, B., Palmgren, C., & Jacobs-Quadrel, M. (1993). Perceived consequences of risky behaviors: Adults and adolescents. *Developmental Psychology*, 29(3), 549-563.
- Cohn, L., Macfarlane, S., Yanez, C., & Imai, W. (1995). Risk-perception: Differences between adolescents and adults. *Health Psychology*, 14(3), 217-222.
- Comstock, J. R. Jr., & Arnegard, R. J. (1992). Multi-attribute task battery for human operator workload and strategic behavior research. NASA Technical Memorandum 104174. Langley Research Center, Hampton, VA: National Aeronautics and Space Administration.
- Crisp, B. R. & Barber, J. G. (1995). The effect of locus of control on the association between risk perception and sexual risk-taking. *Personality and Individual Differences*, 19(6), 841-845.
- Deldin, P. J. & Levin, I. P. (1986). The effect of mood induction in a risky decision-making task. *Bulletin of the Psychonomic Society*, 24(1), 4-6.
- Furby, L., & Beyth-Marom, R. (1992). Risk taking in adolescence: A decision-making perspective. *Developmental Review*, 12(1), 1-44.
- Halpern-Felsher, B., Millstein, S., Ellen, J., Adler, N., Tschann, J., & Biehl, M. (2001). The role of behavioral experience in judging risks. *Health Psychology*, 20(2), 120-126.
- Harris, Kathleen M., Duncan, Greg J., & Boisjoly, Johanne. (2002). Evaluating the role

- of “nothing to lose” attitudes on risky behavior in adolescence. *Social Forces*, 80(3), 1005-1039.
- Irwin, C. E. & Millstein, S. G. (1992). Risk-taking behaviors and biopsychosocial development during adolescence. In E. J. Susman, L. V. Feagans, & W. J. Ray (Eds.), *Emotion, cognition, health, and development in children and adolescents* (pp. 75-102). Hillsdale, NJ: Erlbaum.
- Johnson, R. H. (1978). Individual styles of decision making: A theoretical model for counseling. *Personnel and Guidance Journal*, 56, 530-536.
- Kagan, J. (1966). Developmental studies in reflection and analysis. In A. H. Kidd & J. L. Rivoire (Eds.), *Perceptual development in children* (pp. 487-522). New York: International Universities Press.
- Kopfstein, D. (1973). Risk-taking behavior and cognitive style. *Child Development*, 44(1), 190-192.
- Lavery, B., Siegel, A. W., Cousins, J. H., & Rubovits, D. S. (1993). Adolescent risk-taking: An analysis of problem behaviors in problem children. *Journal of Experimental Child Psychology*, 55(2), 277-294.
- McCord, J. (1990). Problem behaviors. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 414-430). Cambridge, MA: Harvard University Press.
- Millstein, S. & Igra, V. (1995). Theoretical models of adolescent risk-taking behavior. In J. L. Wallander & L. J. Siegel (Eds.), *Adolescent health problems: Behavior perspectives* (pp. 52-71). New York: Guilford Press.

- Millstein, S. G. & Halpern-Felsher, B. L. (2002). Perceptions of risk and vulnerability. *Journal of Adolescent Health, 31*(Suppl1), 10-27.
- Nygren, T. E. (2000, November). *Development of a measure of decision making styles to predict performance in a dynamic J/DM task*. Paper presented at the meeting of the Psychonomic Society, New Orleans, LA.
- Parsons, J. T., Siegel, A. W., & Cousins, J. H. (1997). Late adolescent risk-taking: effects of perceived benefits and perceived risks on behavioral intentions and behavioral change. *Journal of Adolescence, 20*(4), 381-392.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). The use of multiple strategies in judgment and choice. In N. J. Castellan Jr. (Ed.), *Individual and group decision making: Current Issues* (pp. 19-39). Hillsdale, NJ: Erlbaum.
- Petersen, A. C. (1988). Adolescent Development. *Annual Review of Psychology, 39*, 583-607.
- Rolison, M. R. & Scherman, A. (2002). Factors influencing adolescents' decisions to engage in risk-taking behavior. *Adolescence, 37*(147), 585-596.
- Rolison, M. R. & Scherman, A. (2003). College student risk-taking from three perspectives. *Adolescence, 38*(152), 689-704.
- Scott, S. G. & Bruce, R. A. (1995). Decision making style: The development and assessment of a new measure. *Educational and Psychological Measurement, 55*(5), 818-831.
- Siegel, A. W., Cousins, J. H., Rubovits, D. S., Parsons, J. T., Lavery B., & Crowley, C. L. (1994). Adolescents' perceptions of the benefits and risks of their own risk taking. *Journal of Emotional and Behavioral Disorders, 2*(2), 89-98.

Slovic, P. (1966). Risk-taking in children: Age and sex differences. *Child Development*, 37(1), 169-176.

Udry, J. R. (1988). Biological predispositions and social control in adolescent sexual behavior. *American Sociological Review*, 53(5), 709-722.

Udry, J. R. (1990). Biosocial models of adolescent problem behaviors. *Social Biology*, 37(1-2), 1-10.

Table 1

Rank Ordering of RIPS-R Behaviors According to Average Perceived Risk

Behavior	Average Perceived Risk Rating	SD
Drive while drunk	8.42	1.26
Ride with drunk driver	8.23	1.34
Abuse prescribed drugs	7.93	1.59
Have sex without a condom	7.92	1.75
Shoplift	7.17	1.99
Smoke cigarettes	6.46	2.02
Binge/purge	6.35	2.16
Not use seatbelt	6.27	2.03
Have sex	5.79	2.06
Smoke marijuana	5.72	2.51
Get drunk	5.61	2.05
Walk alone at night	5.37	2.19
Drink alcohol	5.11	2.03
Ride a motorcycle	4.87	1.99
Take/use prescribed drugs	3.63	2.47

Note. Perceived risk ratings were made on a 9-point scale (1 = not at all risky, 9 = extremely risk).

Table 2

*Pearson's Correlation Coefficients Among DMI Scales and RIPS-R Subscales by**Behavior*

Factor Loading	Behavior	Correlation with Involvement			
		DMI Scale		RIPS-R Subscale	
		ANA	INT	P. Risk	P. Benefit
Alcohol	Drive while drunk	-.293	.204	-.262	.233
	Ride with drunk driver	-.317	.252	-.297	.497
	Get drunk	-.199	.392	-.439	.517
	Drink alcohol	-.165	.375	-.461	.469
Illegal Drugs	Abuse prescribed drugs	-.141	-.044	-.068	.241
	Smoke marijuana	-.133	.234	-.461	.643
Sexual Behavior	Have sex w/o condom	-.267	.181	-.112	.168
	Have sex	-.199	.338	-.181	.299
Stereotypic Male	Walk alone at night	-.293	-.128	-.377	.466
	Ride a motorcycle	-.033	-.029	.116	.412
Socially Acceptable	Take/use prescribed drugs	-.036	-.278	-.405	.487
	Shoplift	.152	.084	-.084	.131
Imprudent	Smoke cigarettes	-.236	.147	-.118	.407
	Binge/purge	-.110	.242	-.228	.648
	Not use seatbelt	-.092	-.063	-.356	.178

Note. n = 71.

P. Risk = perceived risk; P. Benefit = perceived benefit.

Significant r 's ($p < .05$) are in bold.

Figure Captions

Figure 1. Perceived risk of the “risky” and “nonrisky” behavior options for each scenario.

Figure 2. Perceived risk of the “risky” behavior option for each induction condition.

Figure 3. Perceived risk of the “nonrisky” behavior option for each induction condition.

Figure 1.

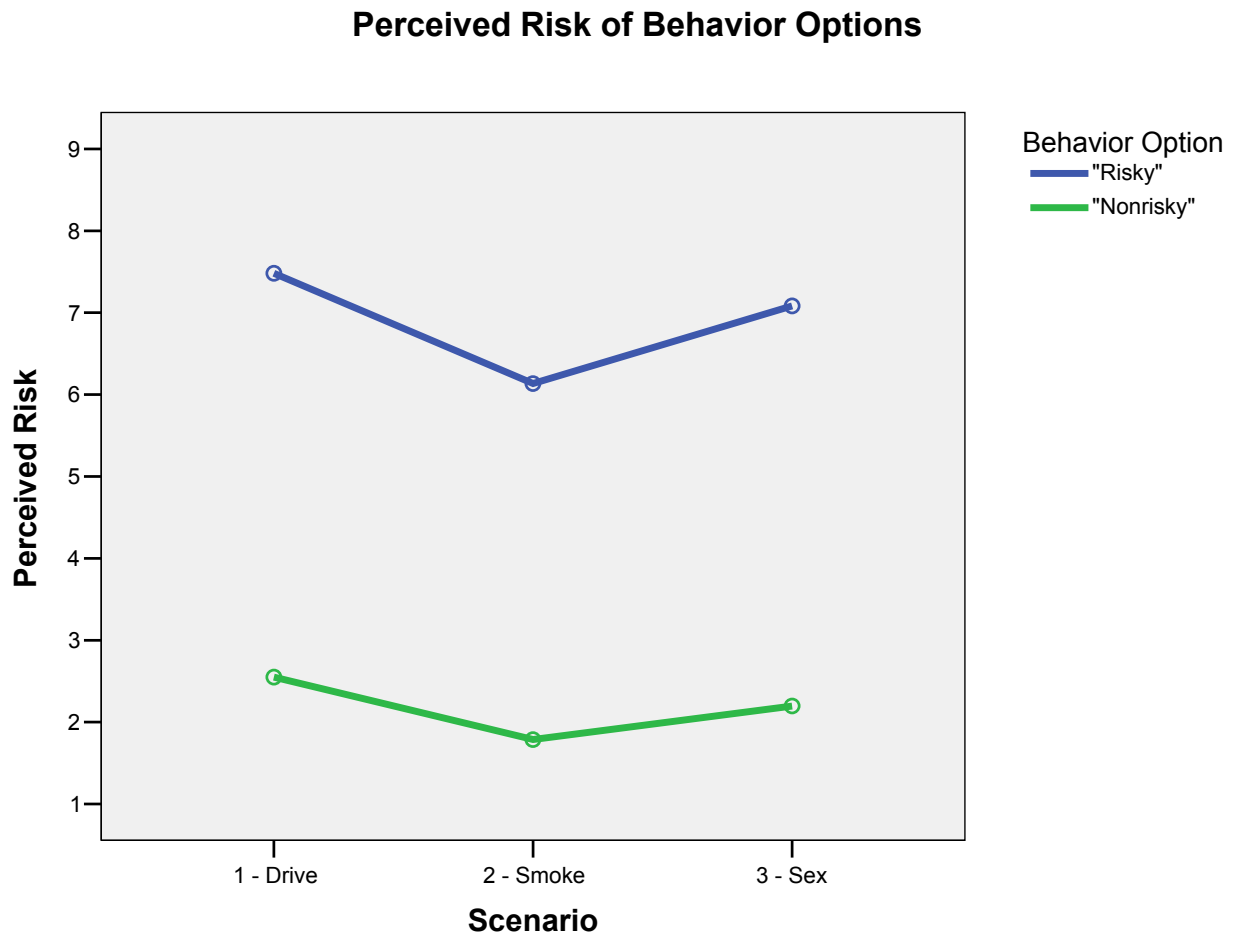


Figure 2.

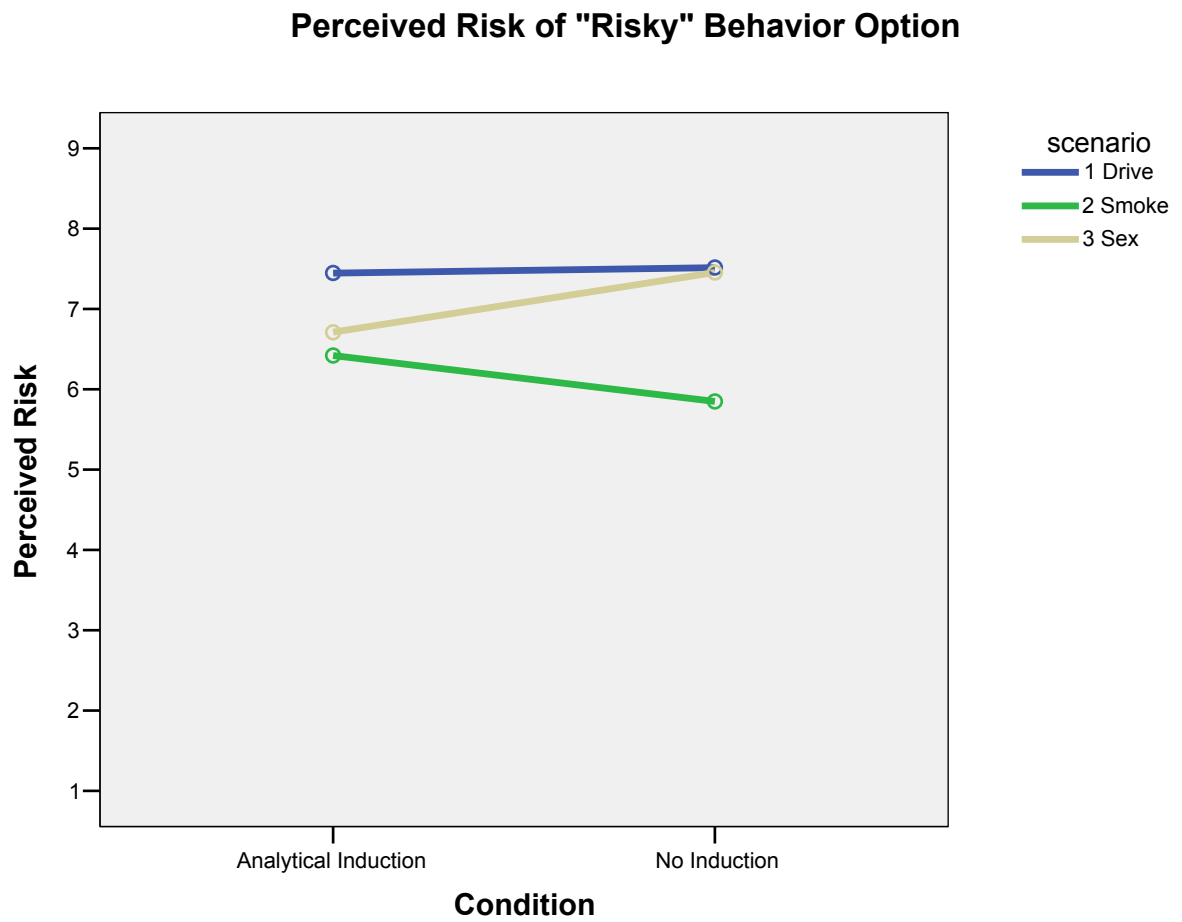


Figure 3.

